Fig. 1

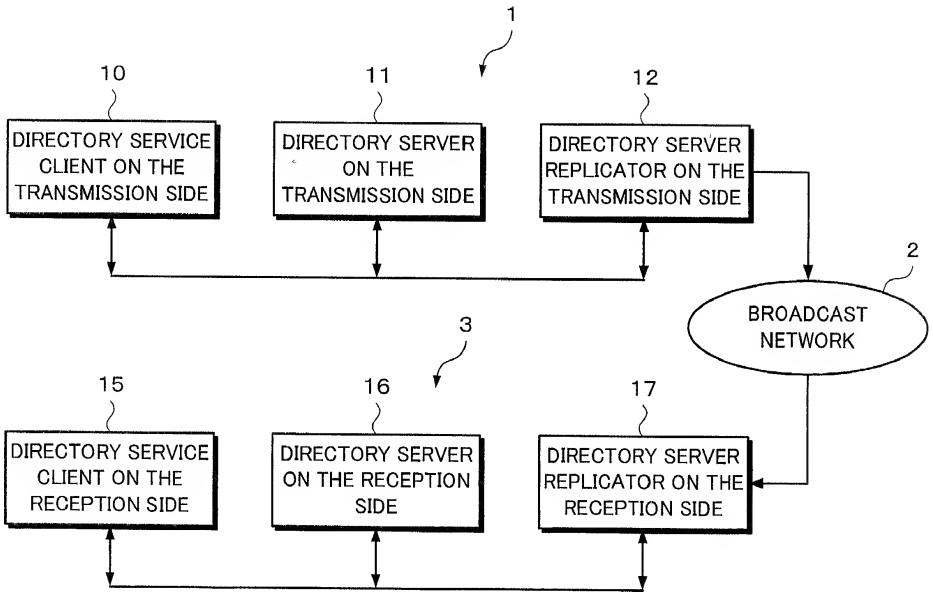
1
10
11
12
DIRECTORY SERVICE CLIENT ON THE TRANSMISSION SIDE
DIRECTORY SERVER ON THE TRANSMISSION SIDE
DIRECTORY SERVER REPLICATOR ON THE TRANSMISSION SIDE
2
BROADCAST NETWORK
3
15
16
17
DIRECTORY SERVICE CLIENT ON THE RECEPTION SIDE
DIRECTORY SERVER ON THE RECEPTION SIDE
DIRECTORY SERVER REPLICATOR ON THE RECEPTION SIDE

Fig. 2

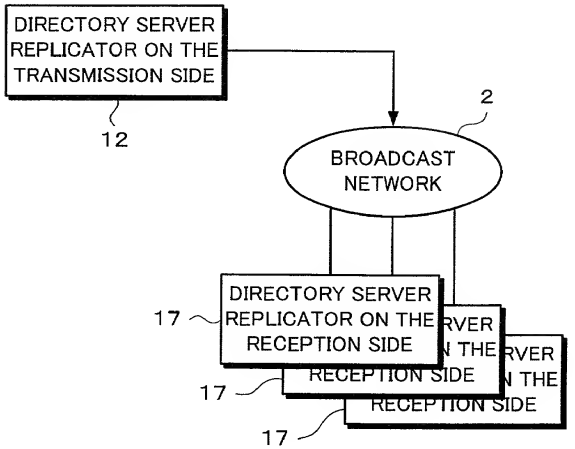
DIRECTORY SERVER REPLICATOR ON THE TRANSMISSION SIDE
12
2
BROADCAST NETWORK
17
DIRECTORY SERVER REPLICATOR ON THE RECEPTION SIDE
17
17

Fig. 3

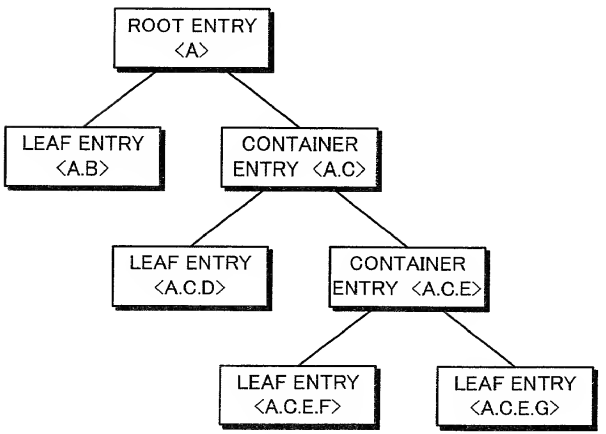
ROOT ENTRY <A>
LEAF ENTRY <A.B>
CONTAINER ENTRY <A.C>
LEAF ENTRY <A.C.D>
CONTAINER ENTRY <A.C.E>
LEAF ENTRY <A.C.E.F>
LEAF ENTRY <A.C.E.G>

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Fig. 4A

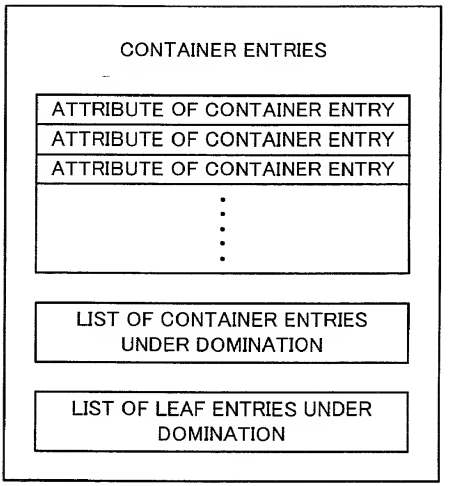

Fig. 4B

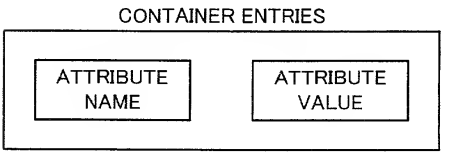

Fig. 5A

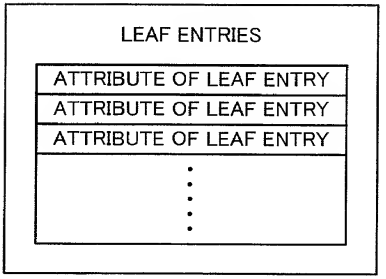
LEAF ENTRIES
ATTRIBUTE OF LEAF ENTRY
ATTRIBUTE OF LEAF ENTRY
ATTRIBUTE OF LEAF ENTRY

Fig. 5B

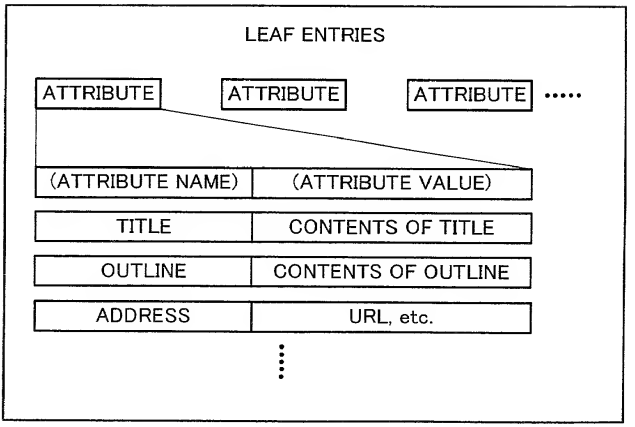
LEAF ENTRIES
ATTRIBUTE
ATTRIBUTE
ATTRIBUTE
(ATTRIBUTE NAME)
(ATTRIBUTE VALUE)
TITLE
CONTENTS OF TITLE
OUTLINE
CONTENTS OF OUTLINE
ADDRESS
URL, etc.

Fig. 6

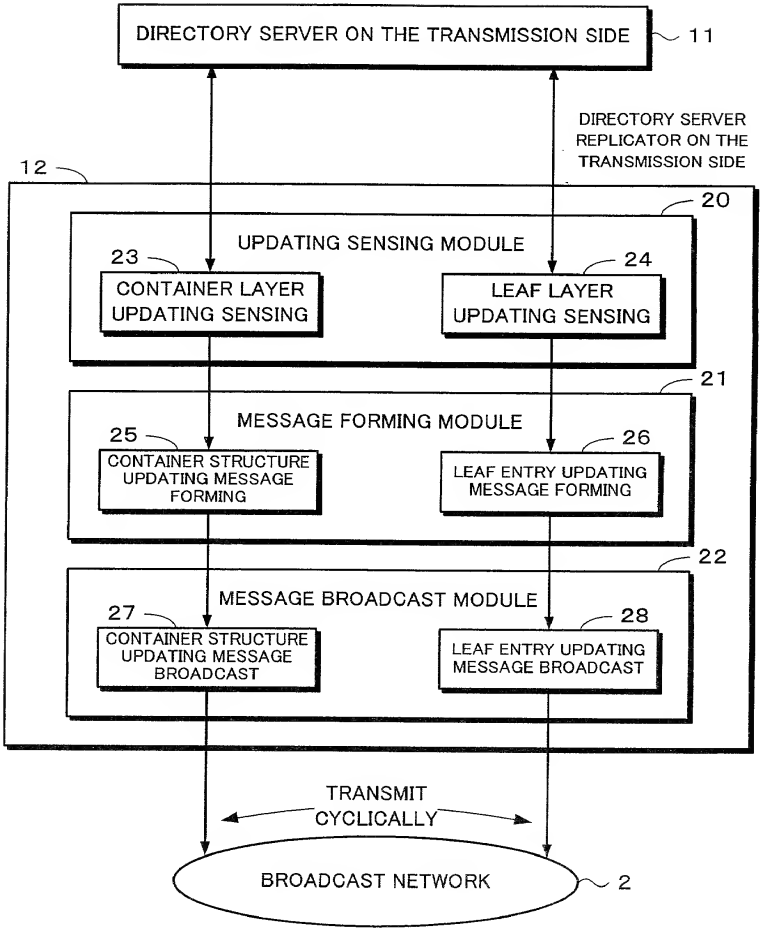
DIRECTORY SERVER ON THE TRANSMISSION SIDE
11
DIRECTORY SERVER REPLICATOR ON THE TRANSMISSION SIDE
12
20
UPDATING SENSING MODULE
23
CONTAINER LAYER UPDATING SENSING
24
LEAF LAYER UPDATING SENSING
21
MESSAGE FORMING MODULE
25
CONTAINER STRUCTURE UPDATING MESSAGE FORMING
26
LEAF ENTRY UPDATING MESSAGE FORMING
22
MESSAGE BROADCAST MODULE
27
CONTAINER STRUCTURE UPDATING MESSAGE BROADCAST
28
LEAF ENTRY UPDATING MESSAGE BROADCAST
TRANSMIT CYCLICALLY
BROADCAST NETWORK
2

Fig. 7

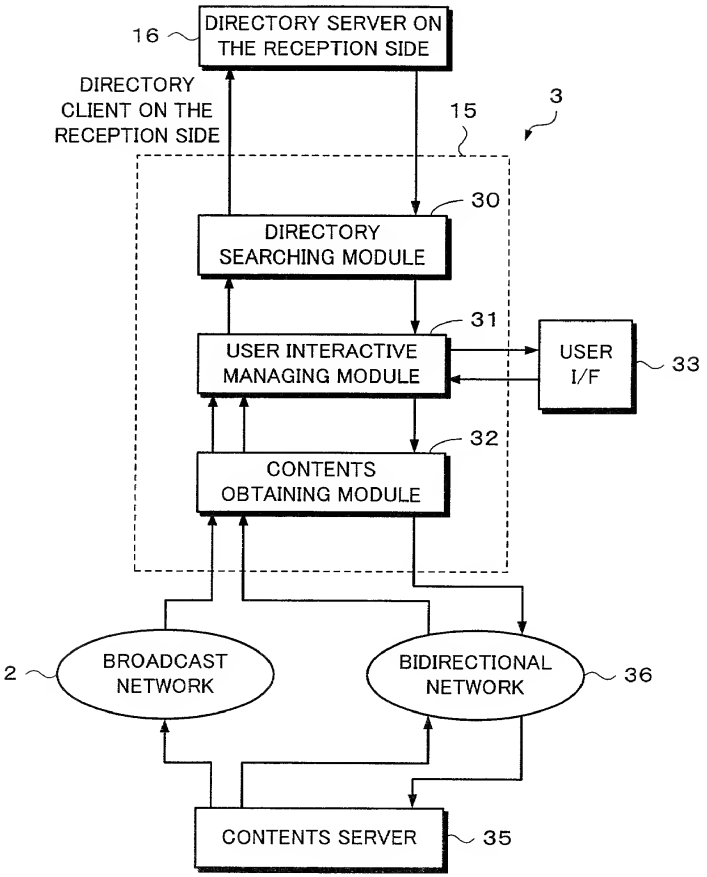
16
DIRECTORY SERVER ON THE RECEPTION SIDE
DIRECTORY CLIENT ON THE RECEPTION SIDE
15
3
30
DIRECTORY SEARCHING MODULE
31
USER INTERACTIVE MANAGING MODULE
USER I/F
33
32
CONTENTS OBTAINING MODULE
2
BROADCAST NETWORK
BIDIRECTIONAL NETWORK
36
CONTENTS SERVER
35

Fig. 8

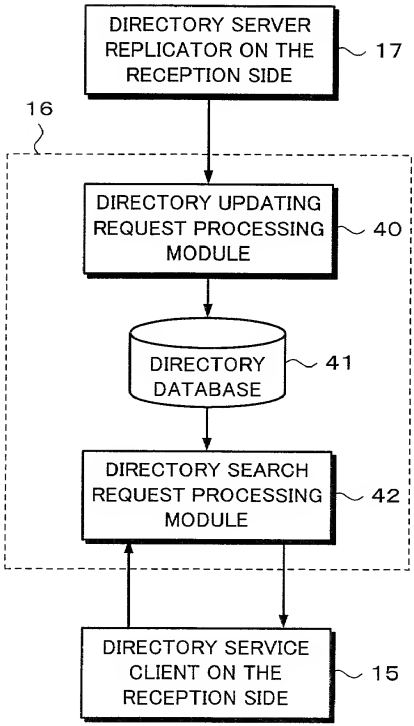
DIRECTORY SERVER REPLICATOR ON THE RECEPTION SIDE
17
16
DIRECTORY UPDATING REQUEST PROCESSING MODULE
40
DIRECTORY DATABASE
41
DIRECTORY SEARCH REQUEST PROCESSING MODULE
42
DIRECTORY SERVICE CLIENT ON THE RECEPTION SIDE
15

Fig. 9A

Fig. 9B

Fig. 9C

Fig. 9D

Fig. 9E

Fig. 9F

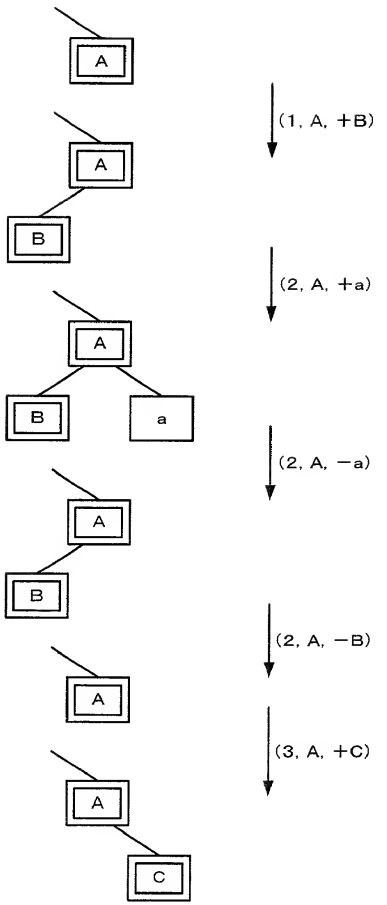

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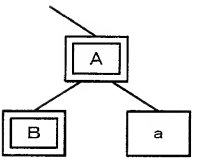
Fig. 10A

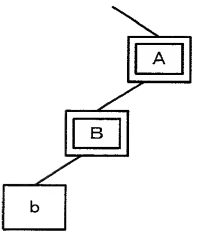
(1, A, +B)
(1, A, +a)

Fig. 10B



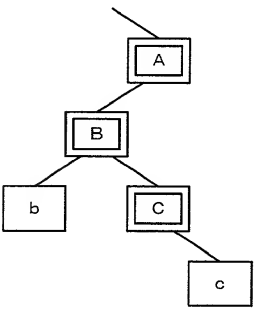
(2, A, −a)
(2, B, +b)

Fig. 10C



(2, B, +C)
(2, C, +C)

Fig. 10D



0353392.052201

Fig. 11

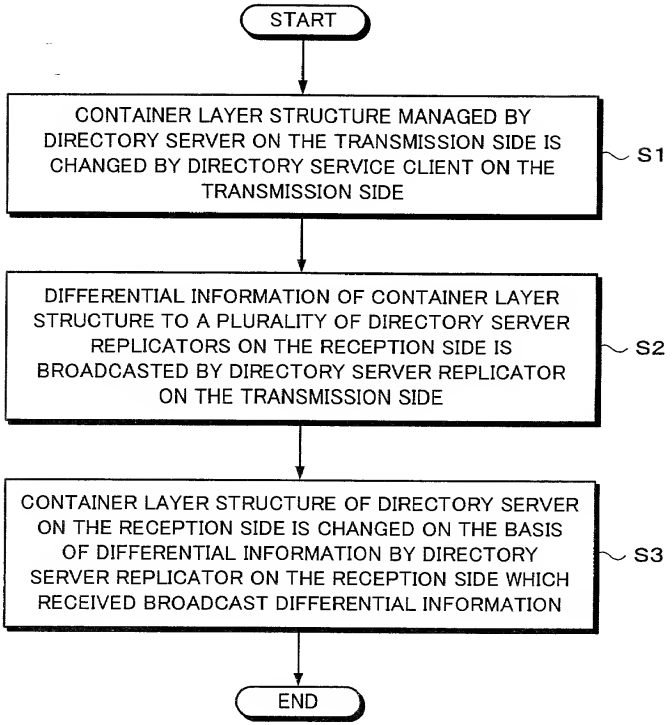


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Fig. 12

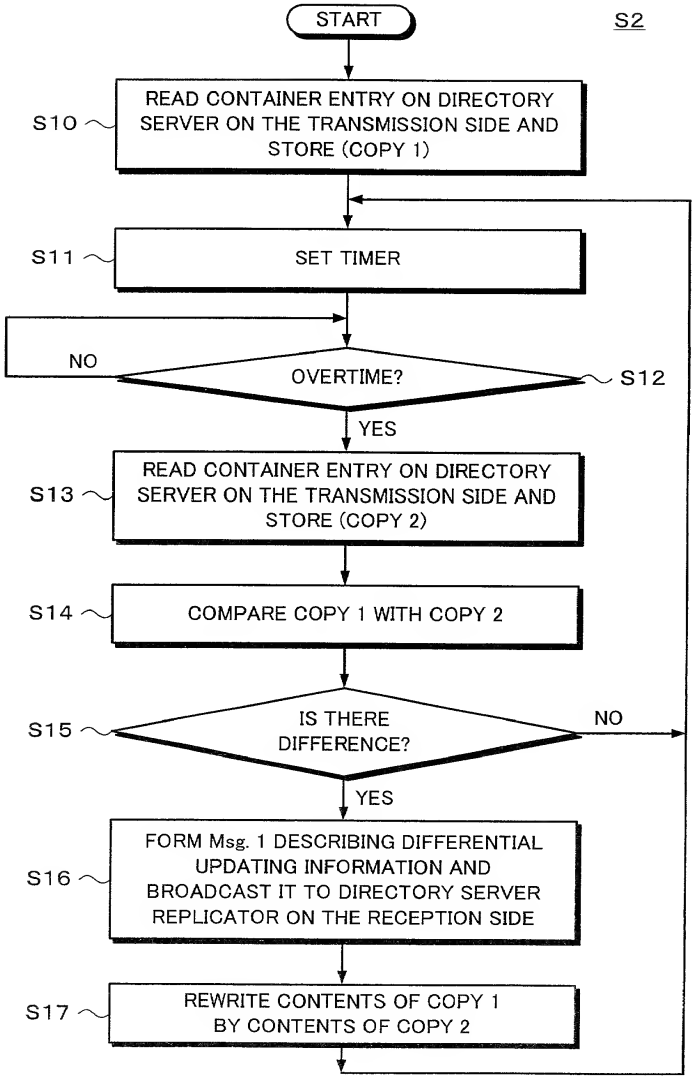

START
S2
S10
READ CONTAINER ENTRY ON DIRECTORY SERVER ON THE TRANSMISSION SIDE AND STORE (COPY 1)
S11
SET TIMER
NO
OVERTIME?
S12
YES
S13
READ CONTAINER ENTRY ON DIRECTORY SERVER ON THE TRANSMISSION SIDE AND STORE (COPY 2)
S14
COMPARE COPY 1 WITH COPY 2
S15
IS THERE DIFFERENCE?
NO
YES
S16
FORM Msg. 1 DESCRIBING DIFFERENTIAL UPDATING INFORMATION AND BROADCAST IT TO DIRECTORY SERVER REPLICATOR ON THE RECEPTION SIDE
S17
REWRITE CONTENTS OF COPY 1 BY CONTENTS OF COPY 2

Fig. 13

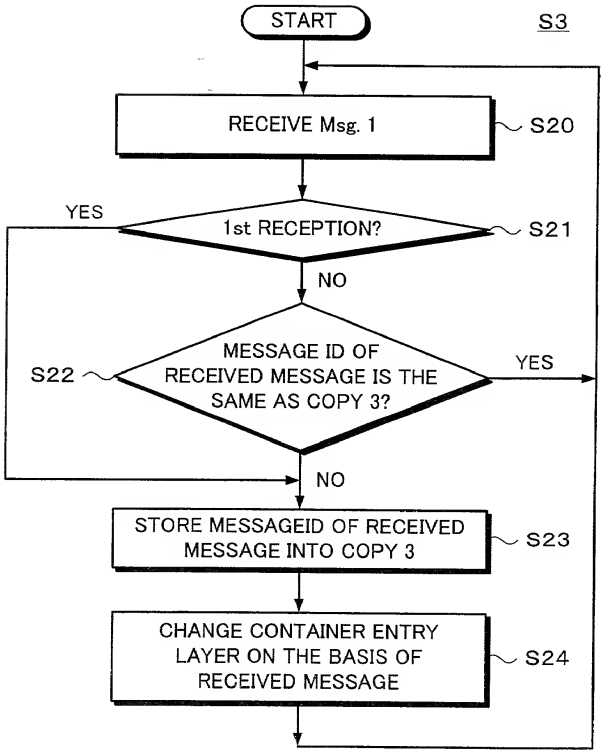

START
S3
RECEIVE Msg. 1
S20
YES
1st RECEPTION?
S21
NO
S22
MESSAGE ID OF RECEIVED MESSAGE IS THE SAME AS COPY 3?
YES
NO
STORE MESSAGEID OF RECEIVED MESSAGE INTO COPY 3
S23
CHANGE CONTAINER ENTRY LAYER ON THE BASIS OF RECEIVED MESSAGE
S24

Fig. 14

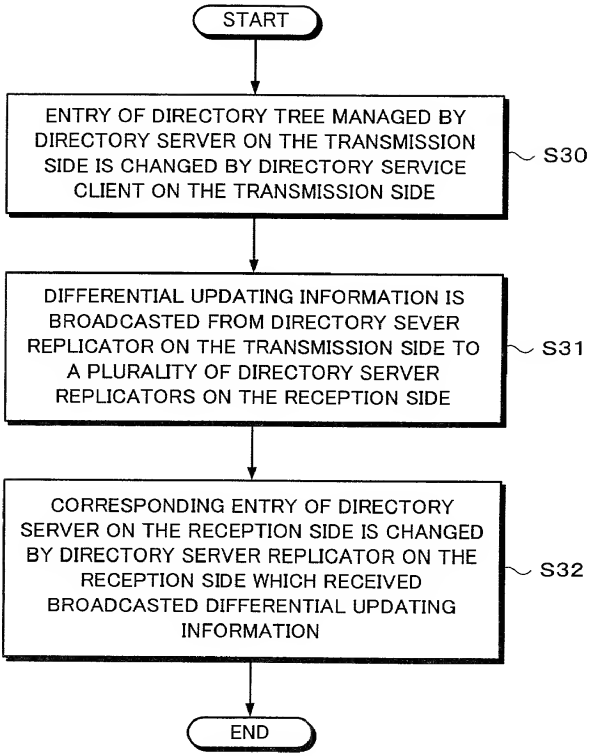

START
ENTRY OF DIRECTORY TREE MANAGED BY DIRECTORY SERVER ON THE TRANSMISSION SIDE IS CHANGED BY DIRECTORY SERVICE CLIENT ON THE TRANSMISSION SIDE
S30
DIFFERENTIAL UPDATING INFORMATION IS BROADCASTED FROM DIRECTORY SEVER REPLICATOR ON THE TRANSMISSION SIDE TO A PLURALITY OF DIRECTORY SERVER REPLICATORS ON THE RECEPTION SIDE
S31
CORRESPONDING ENTRY OF DIRECTORY SERVER ON THE RECEPTION SIDE IS CHANGED BY DIRECTORY SERVER REPLICATOR ON THE RECEPTION SIDE WHICH RECEIVED BROADCASTED DIFFERENTIAL UPDATING INFORMATION
S32
END

Fig. 15

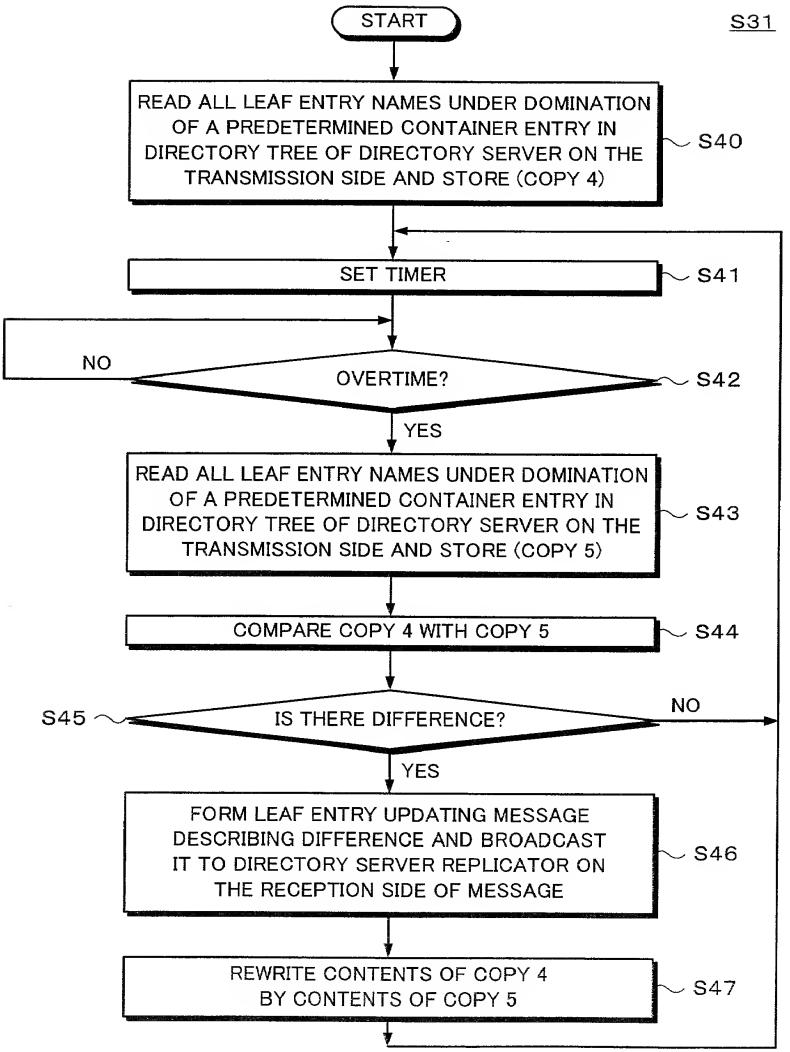

START
S31
READ ALL LEAF ENTRY NAMES UNDER DOMINATION OF A PREDETERMINED CONTAINER ENTRY IN DIRECTORY TREE OF DIRECTORY SERVER ON THE TRANSMISSION SIDE AND STORE (COPY 4)
S40
SET TIMER
S41
NO
OVERTIME?
S42
YES
READ ALL LEAF ENTRY NAMES UNDER DOMINATION OF A PREDETERMINED CONTAINER ENTRY IN DIRECTORY TREE OF DIRECTORY SERVER ON THE TRANSMISSION SIDE AND STORE (COPY 5)
S43
COMPARE COPY 4 WITH COPY 5
S44
S45
IS THERE DIFFERENCE?
NO
YES
FORM LEAF ENTRY UPDATING MESSAGE DESCRIBING DIFFERENCE AND BROADCAST IT TO DIRECTORY SERVER REPLICATOR ON THE RECEPTION SIDE OF MESSAGE
S46
REWRITE CONTENTS OF COPY 4 BY CONTENTS OF COPY 5
S47

Fig. 16

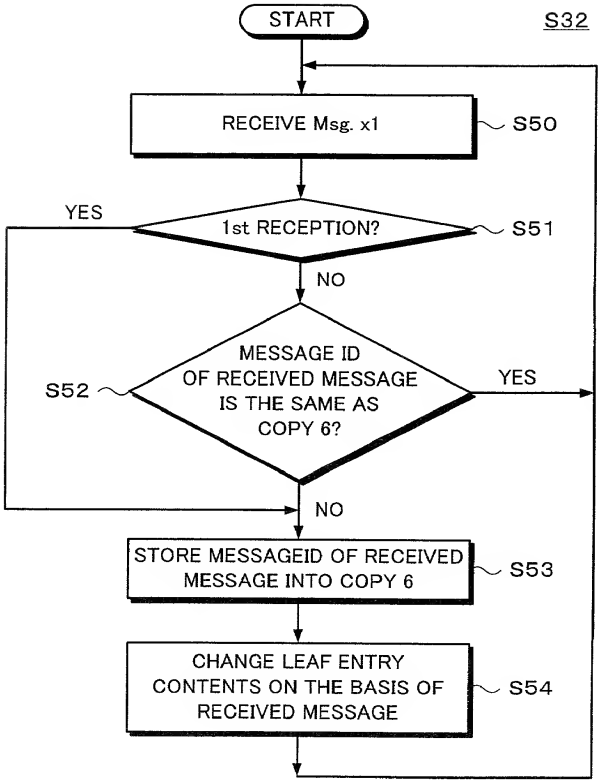

START
S32
RECEIVE Msg. x1
S50
YES
1st RECEPTION?
S51
NO
S52
MESSAGE ID OF RECEIVED MESSAGE IS THE SAME AS COPY 6?
YES
NO
STORE MESSAGEID OF RECEIVED MESSAGE INTO COPY 6
S53
CHANGE LEAF ENTRY CONTENTS ON THE BASIS OF RECEIVED MESSAGE
S54

Fig. 17A

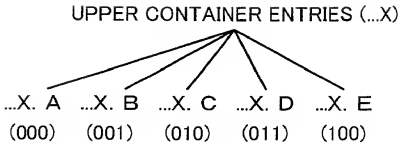


Fig. 17B

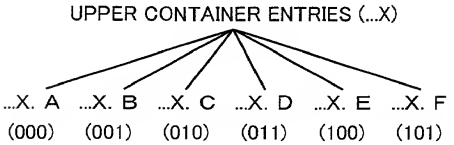


Fig. 17C

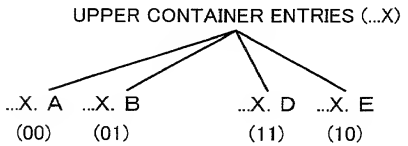


Fig. 17D

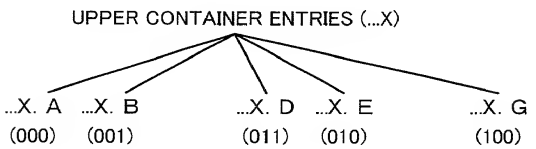


Fig. 18

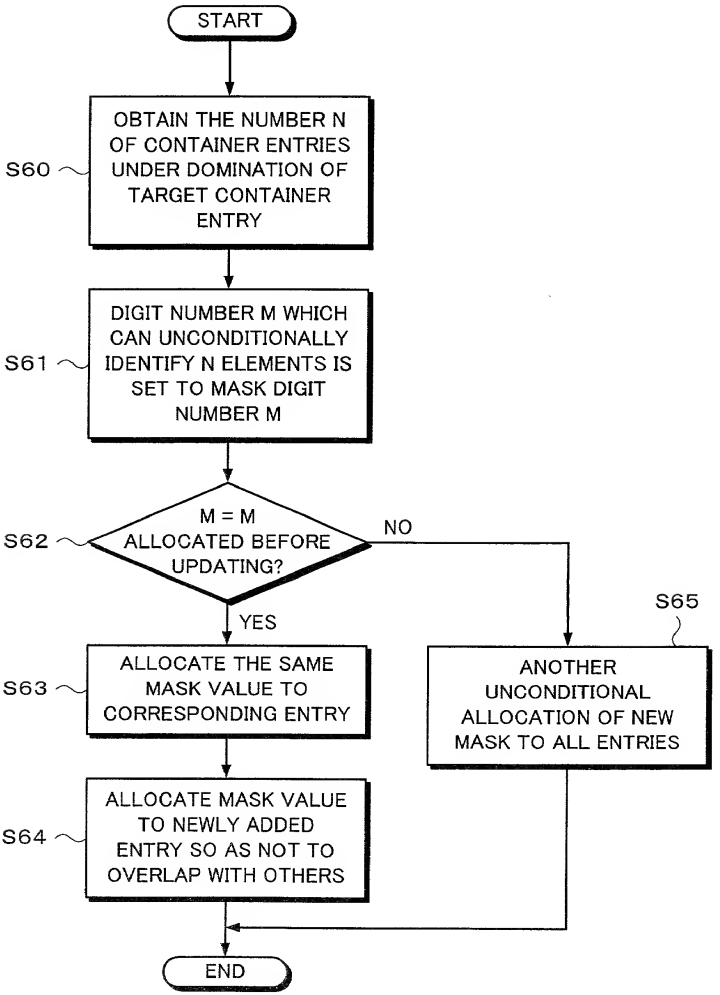

START
OBTAIN THE NUMBER N OF CONTAINER ENTRIES UNDER DOMINATION OF TARGET CONTAINER ENTRY
S60
DIGIT NUMBER M WHICH CAN UNCONDITIONALLY IDENTIFY N ELEMENTS IS SET TO MASK DIGIT NUMBER M
S61
M = M ALLOCATED BEFORE UPDATING?
S62
NO
YES
ALLOCATE THE SAME MASK VALUE TO CORRESPONDING ENTRY
S63
ALLOCATE MASK VALUE TO NEWLY ADDED ENTRY SO AS NOT TO OVERLAP WITH OTHERS
S64
S65
ANOTHER UNCONDITIONAL ALLOCATION OF NEW MASK TO ALL ENTRIES
END

Fig. 19A

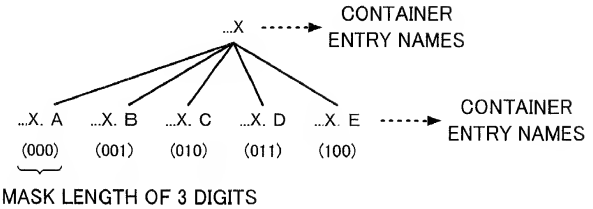


Fig. 19B

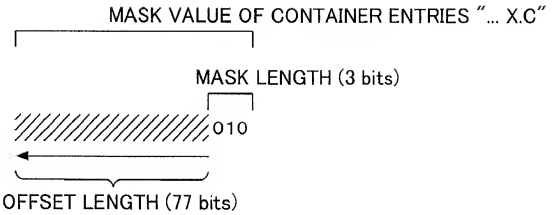


Fig. 20A

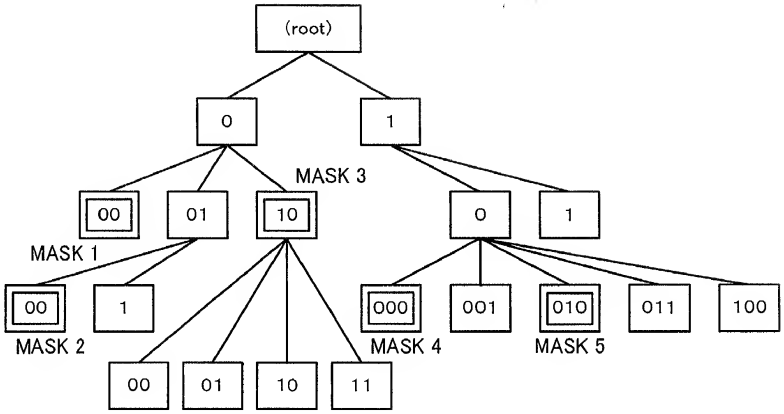


Fig. 20B

TARGET MASK LIST

SCHEMA VERSION : XXX
MASK 1 : 000
MASK 2 : 0010
MASK 3 : 010
MASK 4 : 10000
MASK 5 : 10010

Fig. 21

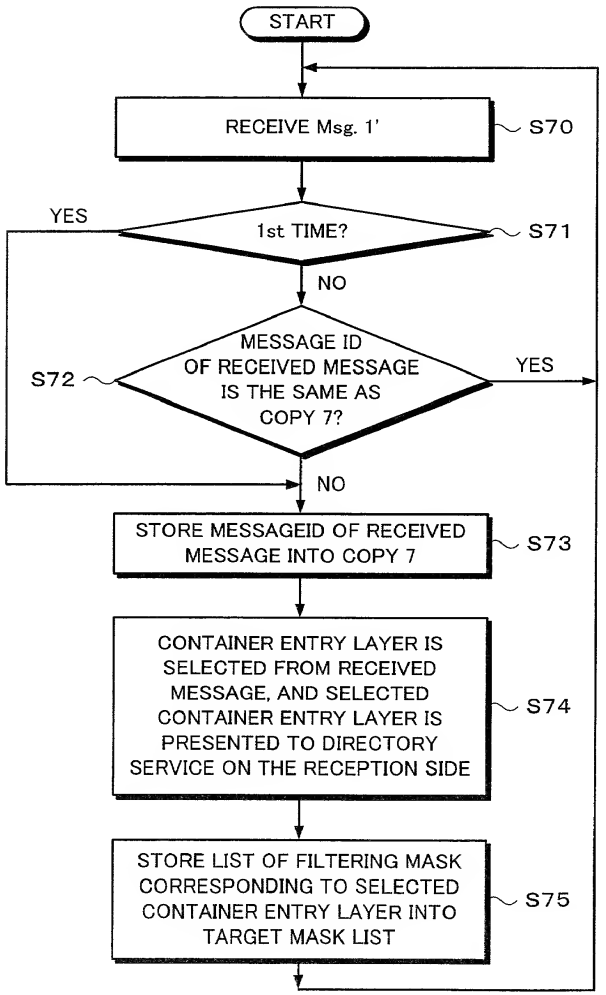
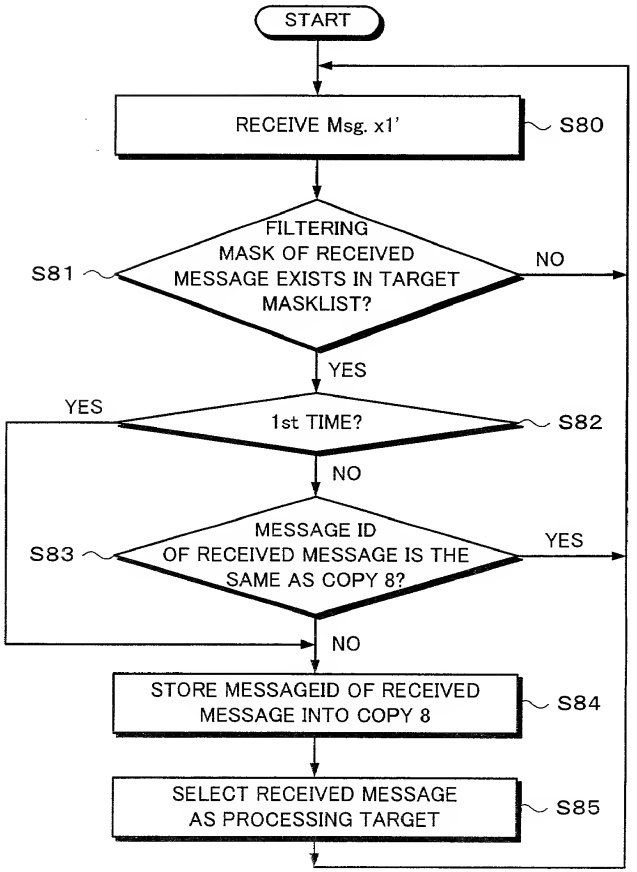
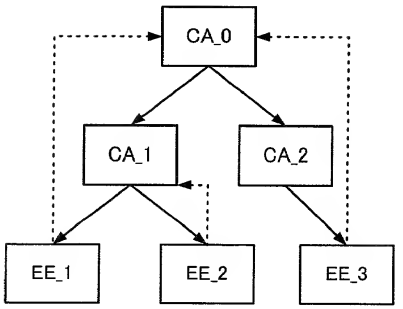

START
RECEIVE Msg. 1'
S70
YES
1st TIME?
S71
NO
S72
MESSAGE ID OF RECEIVED MESSAGE IS THE SAME AS COPY 7?
YES
NO
STORE MESSAGEID OF RECEIVED MESSAGE INTO COPY 7
S73
CONTAINER ENTRY LAYER IS SELECTED FROM RECEIVED MESSAGE, AND SELECTED CONTAINER ENTRY LAYER IS PRESENTED TO DIRECTORY SERVICE ON THE RECEPTION SIDE
S74
STORE LIST OF FILTERING MASK CORRESPONDING TO SELECTED CONTAINER ENTRY LAYER INTO TARGET MASK LIST
S75

Fig. 22


START
RECEIVE Msg. x1'
S80
FILTERING MASK OF RECEIVED MESSAGE EXISTS IN TARGET MASKLIST?
S81
NO
YES
1st TIME?
YES
S82
NO
MESSAGE ID OF RECEIVED MESSAGE IS THE SAME AS COPY 8?
S83
YES
NO
STORE MESSAGEID OF RECEIVED MESSAGE INTO COPY 8
S84
SELECT RECEIVED MESSAGE AS PROCESSING TARGET
S85

EP 2 276 201 A2

Fig. 23



TRUSTED AS A ROOT CERTIFICATE AUTHORITY: ·····→

A PUBLIC KEY CERTIFICATE IS ISSUED: ——→

Fig. 24A

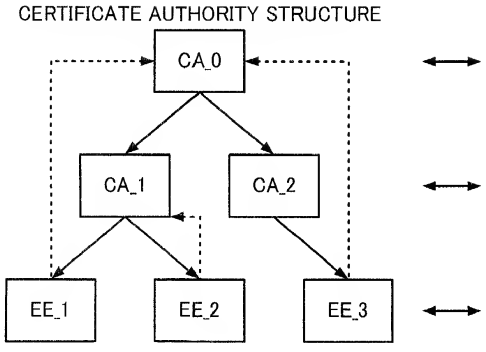


Fig. 24B

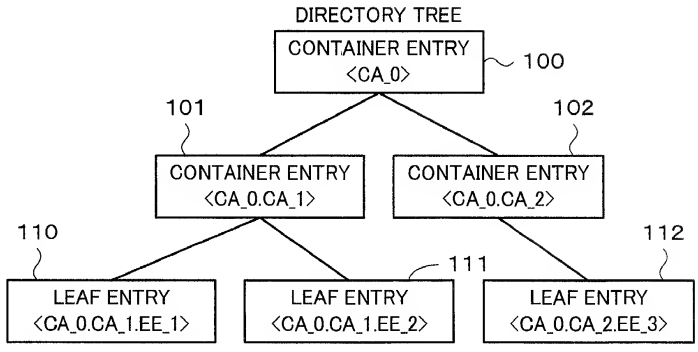


Fig. 25

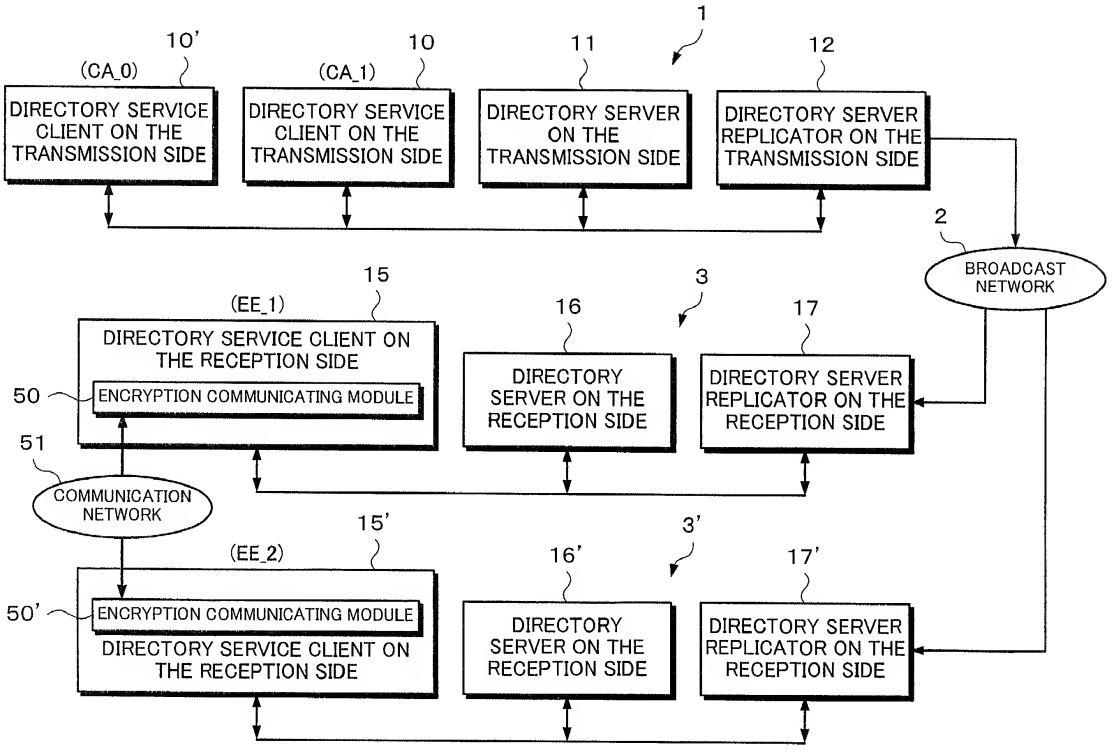
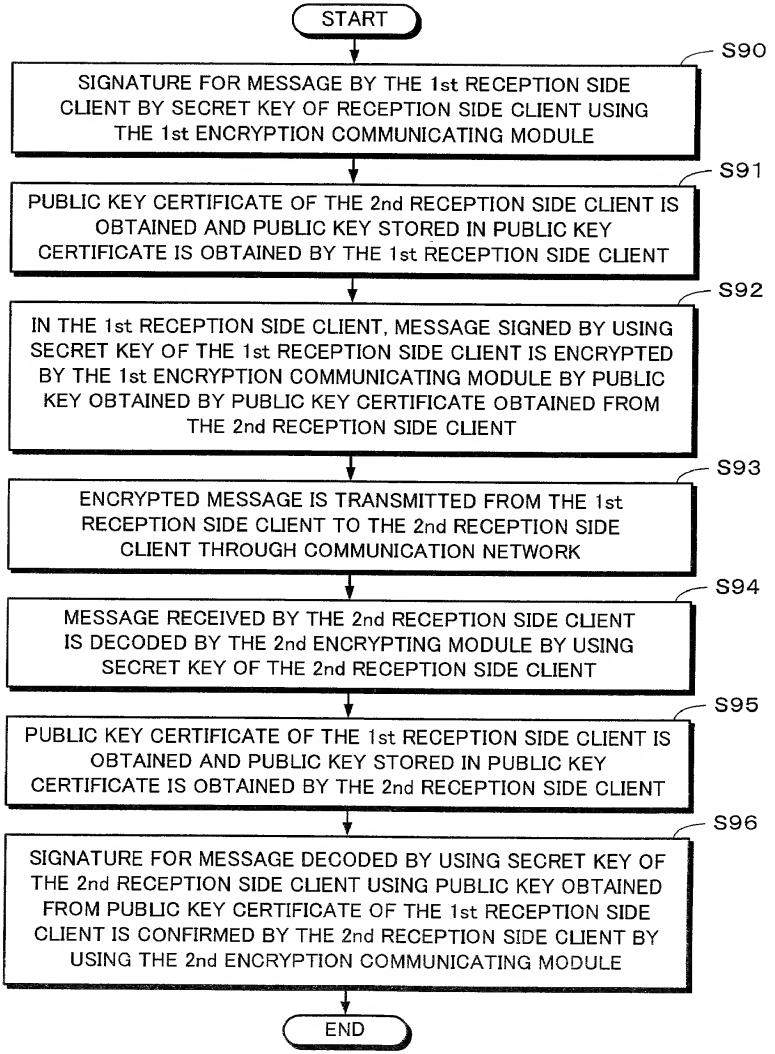

1
10'
(CA_0)
10
(CA_1)
11
12
DIRECTORY SERVICE CLIENT ON THE TRANSMISSION SIDE
DIRECTORY SERVICE CLIENT ON THE TRANSMISSION SIDE
DIRECTORY SERVER ON THE TRANSMISSION SIDE
DIRECTORY SERVER REPLICATOR ON THE TRANSMISSION SIDE
2
BROADCAST NETWORK
15
(EE_1)
3
16
17
DIRECTORY SERVICE CLIENT ON THE RECEPTION SIDE
50
ENCRYPTION COMMUNICATING MODULE
DIRECTORY SERVER ON THE RECEPTION SIDE
DIRECTORY SERVER REPLICATOR ON THE RECEPTION SIDE
51
COMMUNICATION NETWORK
15'
(EE_2)
3'
16'
17'
50'
ENCRYPTION COMMUNICATING MODULE
DIRECTORY SERVICE CLIENT ON THE RECEPTION SIDE
DIRECTORY SERVER ON THE RECEPTION SIDE
DIRECTORY SERVER REPLICATOR ON THE RECEPTION SIDE

Fig. 26



DRAWING SHEET

Fig. 27A

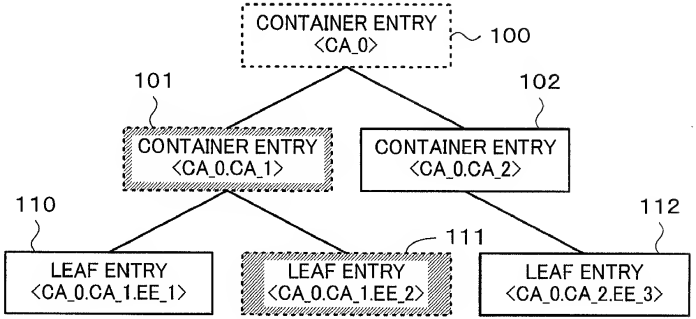


Fig. 27B

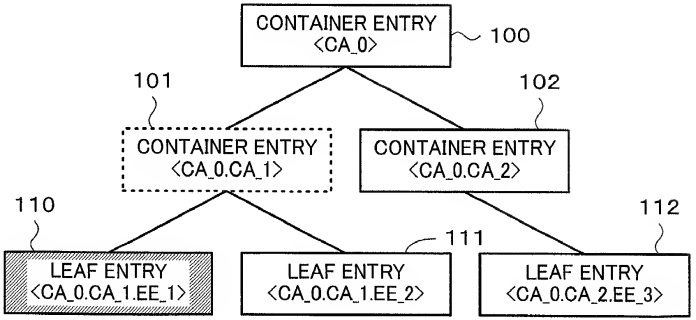
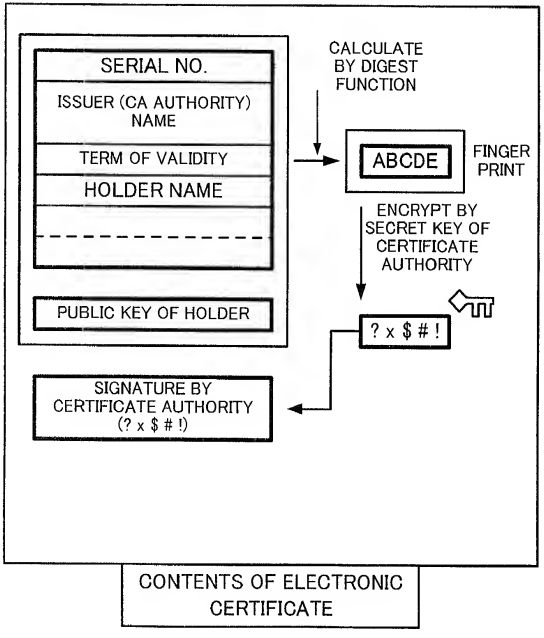
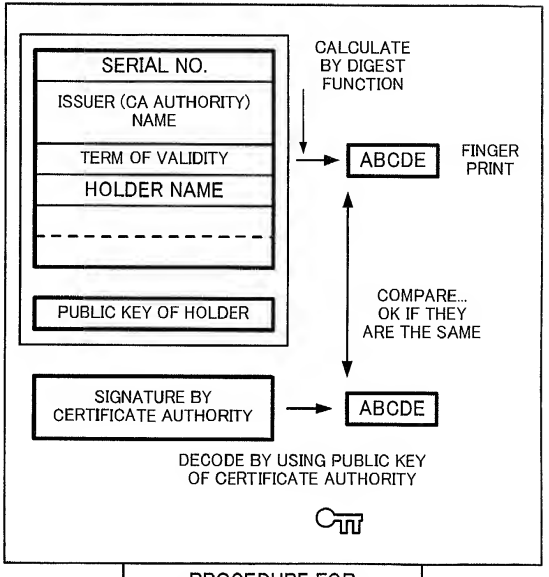


Fig. 28A



CONTENTS OF ELECTRONIC CERTIFICATE

Fig. 28B



PROCEDURE FOR CONFIRMING CERTIFICATE

:SECRET KEY :PUBLIC KEY